TITLE OF THE INVENTION

Sliding Door Security Assembly

CROSS-REFERENCE TO RELATED APPLICATIONS

Not applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not applicable

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates generally to secure ventilating systems for building sliding doors and more particularly to a security insert door assembly for use in sliding doors to maintain adequate security when the sliding door is partially opened for ventilation.

Description of Related Art

In sliding door installations for both home and office, a separate screen slidably positioned outwardly from the sliding doors themselves is typically provided for ventilation while maintaining an adequate insect barrier. However, such screen door additions are of little use in maintaining the security of interior of the home or building as such screens are quite easy to either cut through or totally be removed, providing immediate access into the interior of the home or building.

One arrangement for resolving this security issue is disclosed in U.S. Patent 5,105,868 invented by Riise which teaches a sliding door security screen positionable within the opening established by a sliding door when it is partially opened.

A security ventilating system invented by Maust in U.S. Patent 4,226,049 also teaches an open lattice structure installable into the opening of a partially opened sliding door wherein the open lattice structure provides adequate ventilation while preventing a person from gaining access into the interior of the building either through the openings of the lattice or by its total removal.

The following additional U.S. Patents also teach other unique forms of security door and window panels which are somewhat more remote with respect to the inventive concept of the present invention.

U.S. Patent 4,484,410 to English

U.S. Patent 5,575,321 to Currier

U.S. Patent 5,446,996 to Lamont

U.S. Patent 5,392,570 to Cowan

U.S. Patent 4,400,912 to Wicks, Sr.

U.S. Patent 6,182,397 to Almond

U.S. Patent 4,478,002 to English

The present invention provides a security insert door assembly which is installable into the opening of a sliding glass door in its partially opened position. A locking pin and aligned mating locking pin hole arrangement helps insure that the strength and integrity junction between the facing door stile of the sliding door and that of the insert frame is maintained. Adjustable-in-width sliding door stile engaging flanges are alternately

provided which accommodate differences in overall thicknesses between the insert frame stile and the sliding door stile. Universal features includes an insert frame having a standard height no greater than the shortest sliding door height expected to be encountered in the marketplace. Where taller sliding doors are encountered, a separate upper panel is attachable to the upper transverse member of the insert frame which may be selectable from a variety of panel heights for attachment to the insert frame to exactly match the height of the sliding door.

BRIEF SUMMARY OF THE INVENTION

This invention is directed to a sliding door security insert assembly installable into an opening made when one sliding door mounted for lateral movement within a door frame is partially opened to define the opening between one door jamb and a facing sliding door stile. A substantially rectangular insert frame includes a lower transverse member adapted to be supported on the lower track of the sliding door frame while said upper transverse member is adapted to be positioned into the upper track for lateral sliding movement only there along. An easily adjusted-in-height embodiment is preferred. An elongated locking shim is positionable between the upper transverse member and the upper track to prevent insert frame removal. A pair of locking pins are alternately attached, one to the edge of the insert frame stile and the other to the edge of the facing sliding door stile, each locking pin being adapted to be inserted into a mating hole formed into the facing stile surface whereby the insert frame and the sliding door are securely connectable when closed together.

It is therefore an object of this invention to provide a sliding door security inset assembly which fills an opening made when a sliding door is partially opened a predetermined amount to provide ventilation into the home.

It is yet another object of this invention to provide a uniquely configured sliding door security inset assembly which itself is rendered non-removable from the outside once installed into the sliding door frame against a partially opened sliding door for ventilation.

Yet another object of this invention is to provide interengaging structure between the inset frame stile and the facing stile of the sliding door.

A still further object of this invention is to provide a universal sliding door inset assembly which is adjustable in height and in interengaging features with respect to the sliding door of virtually any sliding door arrangement while providing both ventilation and security.

In accordance with these and other objects which will become apparent hereinafter, the instant invention will now be described with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

Figure 1 is an exploded perspective view of one embodiment of the invention.

Figure 1A is an alternate universal height embodiment of the invention shown in Figure 1.

Figure 2 is a front elevation view of the invention shown in Figure 1 installed into a sliding door frame arrangement.

Figure 3 is a side elevation partial section view of the upper portion of the invention as shown in Figure 2 in conjunction with the upper sliding door frame track into which it engages.

Figure 4 is a view similar to Figure 3 showing the lower portion of the sliding door security insert assembly shown in Figure 2.

Figure 5 is an alternate embodiment of the inventive aspect of the invention shown in Figure 3.

Figure 6 is a top plan section view of another embodiment of the invention positioned for use against a sliding door stile shown in phantom.

Figure 7 is front elevation view of an upper portion of a fully adjustable embodiment of the invention.

Figure 8 is a front elevation view of the adjusting mechanism of Figure 7.

Figure 9 is a perspective view of the top plate of Figure 8.

Figure 10 is a perspective view of the upper adjustable portion of the embodiment shown in Figure 7.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, one embodiment of the invention is shown generally at numeral **10** in Figures 1 and 2. This sliding door security insert assembly **10** includes a substantially rectangular insert frame **12** which is formed of two elongated spaced apart upright tubular insert frame stiles **14** and **16** which are rigidly connected to spaced upper, lower and intermediate tubular transverse members **18**, **20** and **22**, respectively. This insert frame **12** may be fabricated of welded tubular aluminum components or manufactured by other conventional assembly techniques.

Referring additionally to Figures 3 and 4, the assembly **10** is first inserted upwardly between spaced parallel downwardly extending upper track portions **J** and **K** of a conventional sliding upper track **A**. Top panel **30** is rigidly attached atop the upper transverse member **18** by conventional threaded fasteners **34**. Note that the thickness of top panel **30** is preferably equal to the thickness of the insert frame **12**.

After inserting the upper portions **30a** of top panel **30** between upper track portions **J** and **K** and against anti-friction brushes **L** and **M** which are inwardly disposed as shown thereagainst, the lower transverse member **20**, having a generally wedge-shaped bottom edge cavity **38**, is rested atop an elongated sliding guide **H** of a lower sliding door frame track **B**.

At this point, the assembly **10** and insert frame **12** may be lifted from engagement with the lower track **B** to permit unauthorized entry thereby. This is due to gap **36** being typically larger than the vertical movement necessary to disengage the wedge-shaped cavity **38** from the sliding guide **H**.

To compensate and to prevent unauthorized removal of the insert frame **12**, an elongated compensating locking shim **32** is provided and is inserted as shown in Figures 1 and 3 atop the central elongated web **30b** of the top panel **30**. This will reduce the gap down to **36a** seen in Figure 3 which is a smaller distance than required to lift the lower transverse member **H** from engagement with the lower track **B**.

Referring to Figure 5, an alternate embodiment of the elongated locking shim **58** is provided in the form of an elongated tubular member **58**. This embodiment **58** reduces the lifting gap of the insert frame **12** from that shown at **60** to substantially no lifting

movement whatsoever without causing undue frictional resistance by the insertion of this locking shim **58** in a manner shown in Figure 1 during normal sliding door **D** operation.

Referring again specifically to Figure 2, the embodiment **10** includes the insert frame **12** which has a height (or length) substantially equal to that of the sliding door **D** which moves in the direction of the horizontal arrow between the upper and lower tracks **A** and **B**, respectively of sliding door frame **F**. The stile **G** of sliding door **D** positioned snugly against vertical stile **16** will hold the assembly **12** in the position shown and as previously described between the vertical stile **G** and door vertical jamb **C**. Accompanying this embodiment **10**, the elongated locking shim **32** or alternately **58** in Figure 5, secures the arrangement between the upper and lower tracks **A** and **B** as previously described.

However, there is a broad variety of sliding door heights which may be encountered both as new product in the marketplace and in existing structures. These sliding doors may generally range in height from about 77" to 96", depending on age and type of installation. Referring additionally to Figure 1A, a universal embodiment **40** of the invention which includes a standardized insert frame **42** having upper and intermediate transverse members **50** and **48** and insert frame stiles **44** and **46** is also provided. The overall height of this insert frame **42** is less than the minimum height of a typical sliding door to be encountered in the marketplace. To cause the assembly **40** to have a height substantially equal to the length of a particular one of a broad range of sliding doors, a height-compensating top panel **52** is provided and is attached to the upper transverse member **50** as shown and previously described in Figure 3. However, this compensating top panel **52** has elongated rectangular side panels **52a** which would be selected from an

array commercially available top panels when the assembly **40** is purchased, to deal with the larger sliding door height.

Alternately, these top panel portions **54a** may be provided in a universal fashion to equal, in combination with the height of the insert frame **42**, the largest sliding door height, e.g. approximately 96", which may be encountered in the marketplace. Thereafter, a simple trimming operation of these panel portions **54a** which are typically fabricated of aluminum or wood sheet material, may be effected to reduce the overall height of this embodiment to substantially equal that of the longer sliding door. In this embodiment, a screen mesh **56** is added as an insect barrier.

Referring again to Figure 1, two additional unique aspects of the present invention are there shown. First, the mating door stile **G** of the sliding door **D** will typically have a locking latch (not shown) which is lockingly engageable with mating structure (also not shown) attached to the upright door jamb **C**. To insure that the facing surfaces of the upright stile member **16** and the sliding door stile **G** mate directly against one another, a lock cut out slot **28** formed into the insert frame stile **16** is also provided

To insure centralized, symmetric alignment and reinforced engagement between the insert frame stile **16** and the sliding door stile **G**, one or more pairs of offset locking pins **24** and closely spaced corresponding locking pin receiving holes **26** are also provided. These locking pins **24** are threadably secured into the insert frame stile **16** and extend therefrom approximately 1". Matching hole (not shown) is drilled into the sliding door stile **G** to mateably receive each of these locking pins **24**. Additionally, the same locking pin **24** is threadably engaged into and laterally extending from the sliding door stile **G** in spaced relation so it exactly aligns with the locking pin hole **26**. It is preferred that at

least two such pairs of offset locking pins and locking holes as shown in Figure 1 be provided for maximum strength, alignment and security when the assembly **10** is in use.

An alternate interconnection between the respective upright stiles **16** and **G** of the insert frame **12** and the sliding door **D** is provided and is shown in Figure 6. In this interconnection embodiment, two elongated L-section channels **62** are adjustably attachable through elongated slots **64** formed into the overlapping flanges or legs **62a** of each of the channels **62**. A large headed threaded fastener **66** is threadably engaged through both slots **64** into the upright frame insert stile **16** as shown. Prior to tightening of these fasteners **66**, the channels **62** are moved in and out in the direction of the arrows to place flanges **62b** snugly against stile **G** such that the thinner (or thicker) insert frame **12** may be centrally aligned with the thicker (or thinner) sliding door stile **G** of sliding door **D**. The importance of this aspect of the invention is to insure that the upper and lower engagements of the assembly **10** with respect to the upper and lower sliding door frame tracks **A** and **B** as previously described will be maintained. Any improper offset could cause binding and/or disengagement with respect to these upper and lower tracks **A** and **B**. Moreover, should an offset arrangement between stile **16** and **G** be desirable, there is sufficient adjustment within slots **64** to accommodate such a desirable offset from the symmetrical arrangement shown in Figure 6. Lastly, any prying apart effort between the stiles **16** and **G** to force entry will be resisted, not only by conventional locks or pins (not shown) for the partially open sliding door **D**, but also by fasteners **66**.

Referring now to Figures 7 to 10, a fully incrementally adjustable embodiment of the invention, now preferred, is there shown which more easily accommodates the varying heights of sliding doors and their accompanying door frame **F**. This adjustable-in-

height embodiment, an alternate to that shown in Figure 1A, includes a modified insert frame **72** having a lower adjusting plate **102** securely attached to the upper wall **104** of the second highest transverse member **76**. The upper transverse member **74** has end apertures formed therein which slidably accommodate and support an inverted U-shaped adjusting member **78** having upright elongated hollow legs **80** and a transverse upper member **84**.

The upright legs **80** slidably engage for movement in the direction of arrow **110** in Figure 7 so as to vary the height of top flanges **88** to insure proper engagement into the upper track portions **J** and **K** of the upper track **A**.

Two elongated threaded shafts **94** are held for rotation only within mating apertures **108** in the end portions **92** of a top plate **90** as best seen in Figure 9. A bolt nut or head **98** is lockably engaged or made a part thereof of the elongated threaded shafts **94** while a non-slidable washer **100** is attached in spaced relationship on the lower side of flanges **92** as shown. The lower end portions of the threaded shafts **94** are engaged through mating apertures in the bottom plate **102** and held in threaded engagement therewith by a threaded nut **106** which is affixed to the bottom surface of the bottom plate **102** in alignment with the holes formed through end portions thereof.

The top plate **88** bears against bearing plate **86** of the transverse upper member **84** whereby, rotation of the hex drive members **98** causes threaded movement of each of the corresponding threaded shafts **94** within threaded nuts **106** to effect height adjustment in the direction of arrow **110** of the telescoping adjusting member **80**.

While the instant invention has been shown and described herein in what are conceived to be the most practical and preferred embodiments, it is recognized that

departures may be made therefrom within the scope of the invention, which is therefore not to be limited to the details disclosed herein, but is to be afforded the full scope of the claims so as to embrace any and all equivalent apparatus and articles.